PROJECT NUMBER : 2108
PROJECT TITLE : New Product and Filter Technology
SECTION LEADER : W. T. Callaham
PERIOD COVERED : July, 1991

I. FILTER WEB DEVELOPMENT

A. Objective: To characterize web-type filter materials and develop subjectively acceptable products with them.

B. Status: Filters were produced with PM web made with 1, 2, and 3% CB-10 dispersion additive. Evaluation of filter physical quality and cigarette making indicated these materials to be typical of previous PM webs.

Cigarettes were produced with Courtaulds partially de-acetylated cellulose acetate web. The models will be subjectively evaluated against a Control.

PM Web materials produced during the week of June 25 at James River Corporation's Neenah Technical Center were used for filter rodmaking and testing. These materials include cellulon, cotton, and fibrids along with CA staple. The runnability of the CA/Cellulon and CA/CA Fibrids was poor due to poor corrugatability. Inclusion of 10% softwood in the CA/Cellulon web improved the runnability. CA/Cotton was very sensitive to corrugation stress, however, the material did machine acceptably. Variability data is being analyzed currently.

Specifications were written and forwarded to PM engineering for the production of web filter rods by Decoufle, a French machine manufacturer. The filters will be analyzed for variability and fitness for use on PM prototype products.

A bobbin of the latest CA web was received from Celanese. The material was produced in March, 1991, by Kimberly-Clark. The material will be evaluated and compared to data from previous CA web material evaluations in order to assess any manufacturing and/or filter-making improvements which may have occurred.

II. MACHINERY DEVELOPMENT

A. Objective: Develop or modify manufacturing equipment to support Product Development efforts.

B. Status: Initial attribute testing by QE of eight test filters produced on the Hauni ACC P-S-P combiner indicated significant carbon scatter. Cigarettes made from these models will begin subjective testing in 1-2 weeks.

Modifications are continuing to be made to the Strip Application Unit as individual problems are identified during testing. The cork drum was redesigned and tested successfully and currently the cutter head is being modified.

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A meeting was held with Molins ATU personnel to review the design of their proof-of-concept rig. Operating and product specifications were developed with Engineering and Project Tomorrow personnel. Specifications for lap seam adhesive and a video tape of the PM Strip Application Unit in operation were transmitted to aid in their development. Debugging trials will begin at Molins about August 1. Bobbins of standard cigarette wrapper have been slit to 23mm width and shipped for these trials.

More drawings for the laboratory coater have been received from Fox Valley Ltd. Some design changes to assure consistent web tension have been requested of them. A visit was made to Fox Valley to review the design and observe a similar machine built for Kimberly-Clark (currently in their shop).

III. NOVEL FILTERS AND FILTER MATERIALS

A. **Objective:** To investigate novel filters or filter materials for potential applications where increased efficiency, taste response or a novelty is needed.

B. **Status:** BOLD 100's cigarettes produced with James River Gouverneur Mill paper cores were evaluated by the Richmond Panel against a control model and achieved subjective parity. A larger run of this material is planned to support POL testing.

The BOLD factory trial at Cabarrus indicated no problems with King Size filter APHIS feeding, tipping or filter machinability. In the 100s circumference study, all filters in the range of 24.1mm to 24.8mm machined acceptably and passed audit testing by R&D and QA.

A ripper room trial was conducted with the PCC filters and Engineering considers the Cabarrus system acceptable for this filter. Additional optimization is required prior to startup.

BOLD filters continue to be received, sampled and inspected to verify adherence to the lot acceptance plan. Regular weekly meetings are being held with representatives of American Filtrona to review the progress of production of BOLD filters.

Cigarettes were smoked on standard and dual Cambridge pads to provide TPM for fractionation studies by F. Hsu.

Cambridge Lowest 100s cigarettes were made with 1.2 dpf Eastman tow and tested analytically and physically. The control model was the current production design using 1.8/35,000 tow. The results indicate a 22% reduction in tar on the 1.2 dpf filter at equal filter RTD and ventilation. Using design model data, a ventilation decrease of approximately 8% on the test model would yield a tar delivery equal to the control. Additional filters have been requested from Eastman for more extensive testing.

Meetings were held with representatives from Ecusta and Kimberly-Clark Corporations to review data from recent development trials. KC subsequently produced additional models which were run in a factory trial on Lark Milds KS at

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the Manufacturing Center. The two models were at two levels of porosity and were run on three different tipping glue rollers. Ventilation levels of the models are being determined and cigarettes have been submitted to MC Q.A. for defect analyses.

Work has begun on a second run of Parliaments using spiral wound tubes as the mouthpiece to provide the recess.

Cigarettes with hand attached impaction filters and hand ventilated to 30% and 50% levels were machine smoked versus a control Half-Nic model. These models were smoked by the Flavor Technology Domestic Product panel.

Filters were sampled and tested in support of production of IM #14 monitor cigarettes and were analyzed as being physically acceptable.

IV. ALTERNATIVE PLASTICIZERS

A. **Objective:** Qualify alternative plasticizers which offer a product advantage.

B. **Status:** Marlboro KS regular cigarettes with Triacetin and Triethyl Citrate plasticized filters were subjectively evaluated by the Richmond Panel. The models were judged to be significantly different with the Triethyl Citrate model being mouth coating, bitter and dry at 12% ventilation and only mouth coating at 5% ventilation. Selected samples have been sent to ARD for smoke chemistry analyses to determine assignable causes for the subjective differences.

Marlboro Lights KS Menthol models with Triacetin and Triethyl Citrate plasticized filters were subjectively evaluated by the Richmond Panel. The models were judged to be significantly different with the Triethyl Citrate model being mouth coating. Mixtures of Triacetin and Triethyl Citrate will be investigated to eliminate the negative subjective characteristics.

V. CARBON STUDIES

A. **Objective:** Conduct fundamental studies of carbons and carbon filtered cigarettes to better understand their performance.

B. **Status:**

Consolidation: The Richmond panel found no differences between Lark Mild cigarettes made with standard production SCCW and Lark Mild cigarettes made with SCCW without zinc and iron additives.

Parliament 100's filters with Calgon MF2C carbon and with Calgon "PM Carbon" were produced in Semiworks for use in cigarette making at Stockton Street.

Specifications: A request has been submitted to Incoming QA in Richmond and Cabarrus for sieve size analyses of the three production carbons to characterize them using a new standard set of sieve screens. The standard set of sieve screens will be used by all PM USA carbon vendors for reporting sieve analyses and by QA when

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checking production carbons. The standard set of sieve screens include sieves #14, #20, #30, #40, #70, #100, and bottom pan.

Data was analyzed to determine the correlation of carbon tetrachloride activity with dry apparent density and with iodine adsorption. Iodine adsorption is not a feasible approach, but, approximately 75% of CCl_4 activity variation can be explained by the apparent density. This approach is being evaluated to determine its usefulness as a valid QA testing procedure for activity.

VI. MENTHOL TECHNOLOGY

A. **Objective:** To develop alternative mentholation techniques which offer a product advantage.

B. **Status:** Cigarettes with filters made with menthol added into CA dope and MOF controls continue to be submitted to CTSD on a weekly basis to observe aging effects on menthol delivery. Additional filters with menthol added into CA dope have been requested from Eastman to deliver a target 0.50 mg menthol in smoke. Cigarettes were evaluated by Flavor Technology personnel for subjectives.

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